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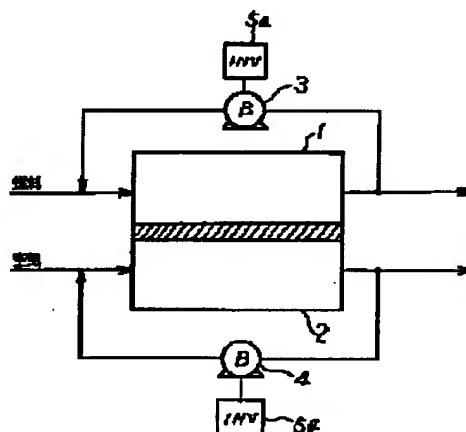
(54) **FUEL CELL POWER PLANT**

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(57) Abstract

PURPOSE: To make voltage constant over the whole load range by keeping the DC voltage of a cell body at a fixed voltage regardless of the value of the direct current in a fuel cell power plant.

CONSTITUTION: A hydrogen gas and the oxygen in the air which have fixed partial pressures generally flow into the fuel electrode 1 and air electrode 2 of a fuel cell body. A fuel recycle blower 3 and an air recycle blower 4 are set between their inlet ports and outlet ports, respectively, to circulate the exhaust gases having low hydrogen and oxygen partial pressures in the outlets to the fuel electrode 1 and the air electrode 2. The recycle blowers 3, 4 have rotation controllers 5a, 5b for controlling the rotating speeds attached thereto, respectively, to control the exhaust gas quantity circulated to the inlet ports. Thus, the hydrogen partial pressure of the fuel cell electrode 1 and the oxygen partial pressure of the air electrode 2 are changed in proportion to the DC voltage, and the DC voltage can be made constant regardless of a change of load.



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CLAIMS

[Claim(s)]

[Claim 1] The fuel cell power generating plant characterized by maintaining the direct current voltage of a cell proper at a fixed electrical potential difference irrespective of the value of a direct current in a fuel cell power generating plant.

[Claim 2] The fuel cell power generating plant according to claim 1 characterized by changing the hydrogen partial pressure of a cell fuel electrode, and the oxygen tension of an air pole in proportion to said direct current.

[Claim 3] The fuel cell power generating plant according to claim 2 characterized by flowing back outlet gas to said cell fuel electrode and said air pole.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Industrial Application] This invention relates to a fuel cell power generating plant.

[0002]

[Description of the Prior Art] A fuel cell power generating plant is used as a power source as non-utility generation, or hot-water supply, an air conditioning, and other heat utilization use exhaust heat for ** taking advantage of the point near the demand ground.

[0003] That, as for the power generating plant which used the fuel cell, diversification of efficient also in small size and a fuel can be measured, it being easy to carry out a deployment of exhaust heat, especially an on-site mold have the descriptions which were excellent in some -- it can install near the demand grounds, such as underground of a building. Therefore, installation is positively planned in each field and installation of a demonstration plant is also prosperous.

[0004] NOX under exhaust air, SOX, the smoke dust of it being a very low value, etc. are promising as a future power plant as compared with another generations-of-electrical-energy facility. It is mainly taking out the electric generating power of the power generating plant which used the fuel cell as an ac output, connecting with an established network, and consumed in most cases. The inverter equipment for the orthogonal transformation is needed, and it has been usually that the direct current also attaches a direct-current-voltage stabilizer at the inverter preceding paragraph in order that an electrical potential difference may change a lot according to a plant output.

[0005]

[Problem(s) to be Solved by the Invention] Since original electric generating power was a direct current, using for the load which can be used as direct current power, a electrolysis ***** power source, etc. was examined, but since an electrical potential difference changed according to the value of the direct current which is the fault of a fuel cell, or it was not employable as the load which needs fixed direct current voltage, it was in the situation which adds a direct-current-voltage stabilizer. The purpose of this invention stabilizes the direct current voltage of a fuel cell, and is to offer the fuel cell power generating plant from which an electrical potential difference becomes fixed with a full load band.

[0006]

[Means for Solving the Problem] The fuel cell power generating plant of this invention maintains the direct current voltage of a cell proper at a fixed electrical potential difference irrespective of the value of a direct current, and changes the hydrogen partial pressure of a cell fuel electrode, and the oxygen tension of an air pole in proportion to a direct current. Moreover, outlet gas is made to flow back to a cell fuel electrode and an air pole.

[0007]

[Function] Exhaust gas with the low hydrogen concentration of an outlet is returned to the inlet port of a fuel electrode. Moreover, if the same operation is performed also to an air pole, it will become possible to reduce each partial pressure of a fuel cell inlet port.

[0008]

[Example] The example of this invention is shown in drawing 1 . The hydrogen gas of a fixed partial pressure and the oxygen in air are usually flowing into the fuel electrode 1 and air pole 2 of the body of a fuel cell. The fuel recycle blower 3 and the air recycle blower 4 which make the hydrogen of an

outlet and the low exhaust gas of oxygen tension return between each inlet port and an outlet are installed. In this recycle blower, the roll control machine 5 which controls a rotational frequency is respectively attached, and controls the amount of exhaust gas made to return to an inlet port.

[0009] Although control of the amount of exhaust gas is not illustrated, a flow rate is controlled with the flow rate function defined beforehand to make regularity direct current voltage of the body of a fuel cell. That is, the direct current voltage of a fuel cell changes with the hydrogen partial pressure of the fuel electrode of a cell proper, and the oxygen tension of an air pole a lot. the hydrogen to which the current power generating plant performed steam reforming for original fuels (methane, LPG, etc.) to the fuel -- since the rich fuel is used, it is always fixed irrespective of a load. Moreover, the oxygen tension of an air pole becomes fixed at 21% which also burns this in order to use atmospheric air.

[0010] The hydrogen partial pressure of a fuel electrode is lowered at the time of low loading, and it operates. Moreover, if the oxygen tension of an air pole is lowered similarly, direct current voltage can be made regularity irrespective of change of a load. Moreover, since the direct current voltage of a cell proper became fixed over a full load band, the direct-current-voltage stabilizer currently installed by the Prior art became unnecessary, and became connectable with a load about the direct cell dc output. The completely same effectiveness can be acquired also by injecting inert gas into each inlet port.

[0011]

[Effect of the Invention] As stated above, according to this invention, direct current voltage can be gone up and down by the laminating number of sheets of a cell simple substance. By carrying out the laminating of the cell simple substance of the number of sheets equivalent to the electrical potential difference which suits a load by this invention, the output of the electrical potential difference of arbitration could be realized easily, and the direct-current stabilizer needed until now was able to be omitted.

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] The explanatory view of one example of this invention

[Description of Notations]

- 1 -- Fuel electrode
 - 2 -- Air pole
 - 3 -- Fuel recycle blower
 - 4 -- Air recycle
 - 5 -- Roll control machine
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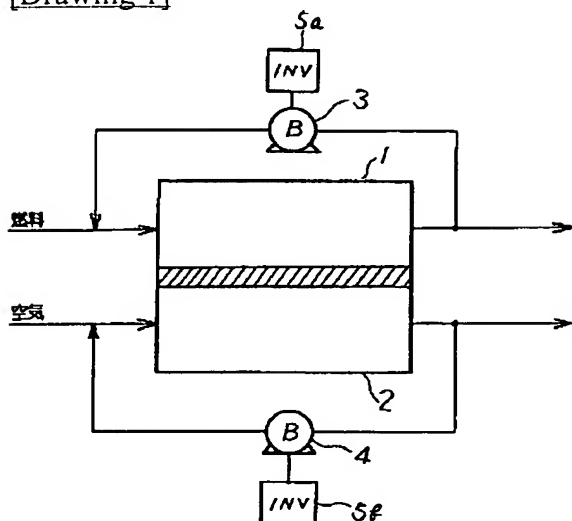
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DRAWINGS

[Drawing 1]



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